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ARCHIVES OF PEDIATRICS

A MONTHLY DEVOTED TO THE

DISEASES OF INFANTS AND CHILDREN

JOHN FITCH LANDON, M.D., Editor

LEADING ARTICLES IN THIS NUMBER

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CONTENTS

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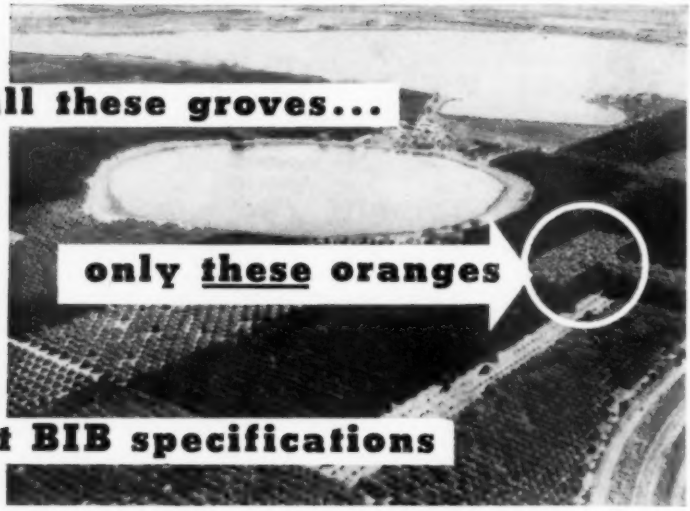
(Continued on page 5)



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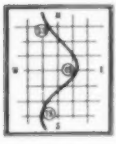

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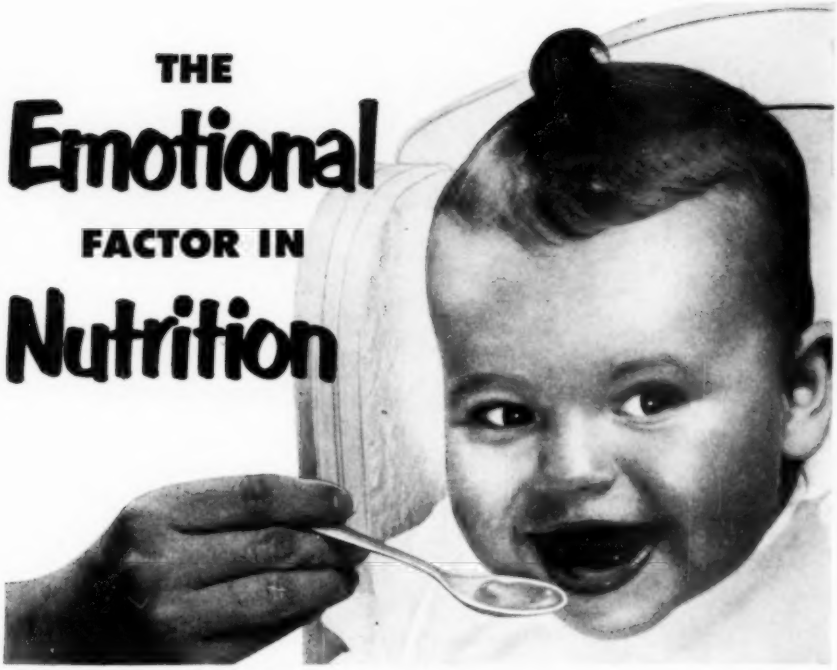

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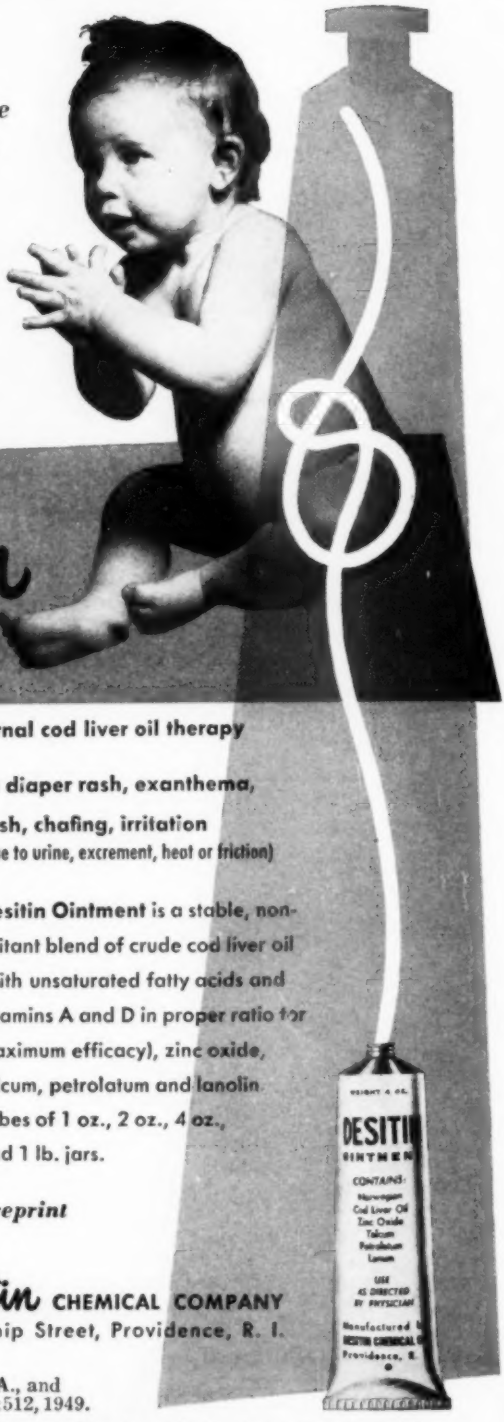

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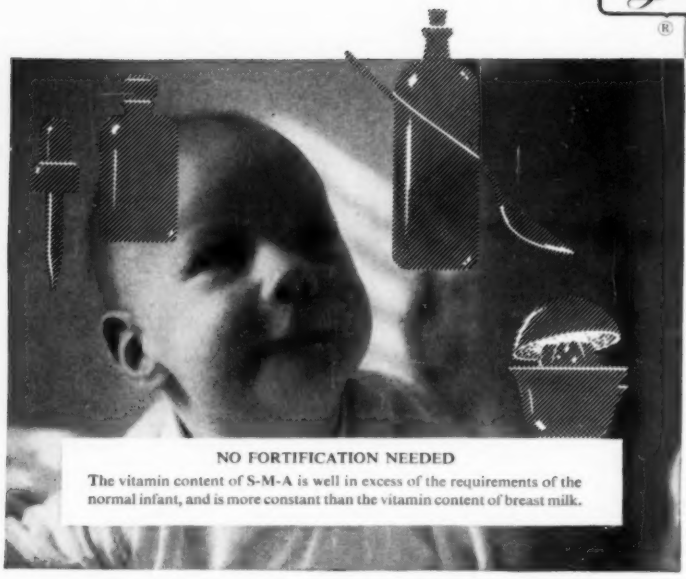

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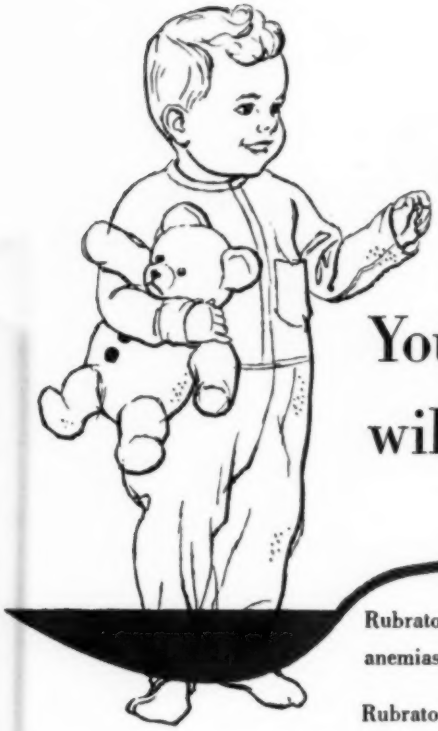
1 Follis, R. H., Jackson, D., Eliot, M. M., and Park, E. A.: *Am. Jour. Dis. Child.*, 66:1, July, 1943.
2 Stearns, G.: *Jour. Lancet*, 63:344, Nov., 1943.



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ARCHIVES OF PEDIATRICS

VOL. 68 JANUARY 1951 No. 1

JOHN FITCH LANDON, M.D., Editor

VITAMIN C IN THE PROPHYLAXIS AND THERAPY OF INFECTIOUS DISEASES

W. J. McCORMICK, M.D.

Toronto, Canada.

During the past century there has been a gradual decline in the incidence and case-mortality rates of most infectious diseases, as well as a marked shift in the age incidence. This trend is readily demonstrated by a brief survey of statistics.

Tuberculosis. At the beginning of the 19th century this disease caused one-fifth of all deaths in western Europe. In London the rate was even higher—30 per cent. In the large American cities the death rate at that time was about 400 per 100,000 of population. To illustrate the rate of decline in England the figures for the city of Ipswich in ten-year averages from 1840 to 1940 are as follows: 393, 340, 320, 305, 268, 217, 183, 151, 100 and 69, indicating an almost even decline throughout. These figures are closely paralleled for a corresponding period in Massachusetts, in which an evenly graded reduction in tuberculosis mortality from 444 to 36 occurred between 1859 and 1939. The change in age incidence has also been very marked. Fifty years ago the peak of incidence was in the third decade of life, with a rather high rate in infancy and childhood. Today the older age groups, 50 to 60 years, are mostly affected, and the early age groups are almost completely exempt.

Pneumonia. At the beginning of the present century this disease exceeded tuberculosis as a cause of death. In the past fifty years the mortality rates for this disease have also shown a steady decline from about 200 to 40 or less.

Diphtheria. Prior to the present century this disease was the major scourge of infancy and childhood. The mortality rates in the United States, for consecutive ten-year periods from 1900 to 1940, were as follows: 40, 21, 15, 5 and 1. For the city of Toronto, for ten-year periods from 1885 to 1945, the rates were as follows: 132, 66, 34, 19, 8 and 3. These figures show a steady reduction in mortality which began over 60 years ago. The age incidence has also advanced into older brackets.

A similar general decline in incidence and mortality rates for other infectious diseases, notably scarlet fever, whooping cough, measles, mumps, rheumatic fever and typhoid fever, has also been recorded.

The usual explanation offered for this changed trend in infectious diseases has been the forward march of medicine in prophylaxis and therapy; but, from a study of the literature, it is evident that these changes in incidence and mortality have been neither synchronous with nor proportionate to such measures. The decline in tuberculosis, for instance, began long before any special control measures, such as mass x-ray and sanitarium treatment, were instituted, even long before the infectious nature of the disease was discovered. The decline in pneumonia also began long before the use of the antibiotic drugs. Likewise, the decline in diphtheria, whooping cough and typhoid fever began fully fifty years prior to the inception of artificial immunization and followed an almost even grade before and after the adoption of these control measures. In the case of scarlet fever, mumps, measles and rheumatic fever there has been no specific innovation in control measures, yet these also have followed the same general pattern in incidence decline. Furthermore, puerperal and infant mortality (under one year) has also shown a steady decline in keeping with that of the infectious diseases, thus obviously indicating the influence of some over-all unrecognized prophylactic factor.

Commenting on this orderly decline Ross[1] says: "While the control measures which have been applied have possibly accentuated the decline in young adult life . . . it seems reasonable to attribute the general decline to other factors more general in character and of which but little is really known." In support of this statement Ross compares the tuberculosis mortality of Mexico City with Ontario (Canada), showing that the decline in the former

has been more rapid than in the latter in spite of the fact that in Mexico City there were no sanitaria, no diagnostic clinics and no antituberculosis movement. On this same subject McKinnon[2] says: "Quite obviously then, all the factors mentioned are not adequate in themselves to explain the recorded decline. Some other factor or factors must have been operating during this period and it is necessary to cast farther afield in search of them."

THE AUTHOR'S HYPOTHESIS

The most logical explanation for this uniformity in decline of infectious diseases, regardless of control measures, would seem to be that resistance to infection in general has been increased gradually throughout the past century, particularly in the younger age groups, and that the major factor in producing this result is most likely to have been some changed trend in nutrition. On this basis, artificial control measures which have mostly been applied within the last three decades would play a minor or supplemental role.

From increasing evidence of the anti-toxic and anti-infectious action of vitamin C, and from personal clinical experience in the prophylactic and therapeutic application of this vitamin, the author is firmly convinced that the major factor in bringing about this gradually changing picture in infectious-disease incidence has been the steady and phenomenal increase in the consumption of vitamin-C-rich fruits, notably citrus fruits and tomatoes, during the period in question. This hypothesis would not only account for the gradual decline in incidence, but would also explain the shift in age incidence of tuberculosis, diphtheria, poliomyelitis, etc., from the younger to the older age brackets, due to the fact that in the nursery the full benefit of this nutritional reform is obtained; whereas, during childhood and early youth perverse dietary habits are gradually acquired through lack of parental guidance and inadequacy of public-health education. The increased use of candy, carbonated beverages, tea, coffee, tobacco and alcohol tends gradually to displace the more wholesome nutritional habits of early childhood, and malnutrition with increased susceptibility to disease is the price we pay for this diversion.

Chemically, vitamin C is known to be a potent reducing and oxidizing agent, its decolorizing action on the test reagent, dichlorphenol-indophenol, being dependent upon this property. This same

action brings about the neutralization or destruction of bacterial and other organic toxins. It is also known to play an essential part in the oxidation-reduction system of the body and in the production of antibodies, thus favoring development of natural resistance to disease. During the recent world war it was found that German children, receiving a supplement of 50 mg. of vitamin C daily, were less susceptible to infection than controls.[3] More recently, Nungster and Ames[4] reported that vitamin C greatly increased the phagocytic action of white blood cells against infectious organisms.

CLINICAL OBSERVATIONS

It seems logical to assume that any agent which acts prophylactically should also have therapeutic value in infectious diseases, and vice versa. Accordingly, a brief summary of the clinical uses of vitamin C in this respect follows:

Tuberculosis. Many investigators have studied the effect of vitamin C in this disease because of its favorable influence on fibroblastic connective tissue, so essential to the healing of the exudative or ulcerative lesions. Birkhang[5] found that optimal vitamin-C level, induced by supplemental intake of ascorbic acid, produced an increase in body weight and reduction in tuberculous lesions in guinea pigs. Microscopic examination revealed less caseonecrotic lesions and more collagenous tissue in and around the tubercular centers than was observed in controls. Albrecht[6] found that daily subcutaneous injections of vitamin C in tubercular patients increased appetite, improved general health and blood picture, and frequently decreased the temperature. Borsalino,[7] reporting observations on 140 tubercular patients, found that vitamin-C therapy rapidly increased capillary resistance and stopped pulmonary hemorrhage, which reappeared when the treatment was discontinued.

Early in the history of this disease Richard Morton, in his classical work "Phthisiologia" (1689), stated that "scurvy is wont to occasion a consumption of the lungs."

Pneumonia. Hochwald[8] reports that vitamin C, 500 mg. every 90 minutes until the temperature drops to normal, exerts a curative effect in croupous pneumonia as shown by lessened prostration and dyspnea, early return to normal temperature, quicker disappearance

of local findings and normalization of white-blood-cell picture. More recently, Slotkin and Fletcher,[9] reporting on the value of vitamin C in postoperative pneumonia, summarize their findings as follows: "Pulmonary complications in old debilitated patients requiring prostatic surgery is a common cause of death. The pulmonary lesions most noted were bronchopneumonia, lung abscess and purulent bronchitis. Most of these cases are so-called 'wet chests,' due to capillary secretions. Ascorbic acid, which increases the tonicity of these capillaries, has been of great value in alleviating these patients and in restoring prompt pulmonary action by the disappearance of this infiltration." (In this connection it should be noted that pneumonia is often the terminal cause of death in frank scurvy, and that the "rusty brown" sputum in pneumonia may in reality be a sign of the hemorrhagic status of the scorbutic background). According to Klenner,[10] pneumonia never develops as a complication of measles when intensive vitamin-C therapy is employed, following which all symptoms usually disappear within 48 hours.

Diphtheria. In the early history of this disease, when it was known as malignant angina or gangrenous sore throat, many observers reported the frequent concurrence of "gangrenous gingivitis." Many physicians at that time regarded this complication as evidence of a scorbutic background. Boerhaave, a Dutch physician of international repute in the 18th century, held strongly to this viewpoint. The frequent concurrence of epistaxis and the profuse bleeding from the denuded fauces upon removal of the false membrane, so characteristic of diphtheria, are very suggestive of the hemorrhagic status of scurvy. Certainly, at that time scurvy was very prevalent in central and northern Europe, where the supply of fresh fruits was much less than in countries bordering upon the Mediterranean. The basic concurrence of this condition may have determined the very high case-fatality rate in diphtheria (80 per cent) at that time.

Recently, Klenner[10] reports the successful treatment of diphtheria by intensive vitamin-C parenterally, 1,000 to 2,000 mg. every two to four hours. He says that the cure by this therapy is effected in half the time required to remove the membrane and get negative smears by antitoxin. The membrane is removed by lysis when vitamin C is used in this way, rather than by sloughing as with

antitoxin, and with the further advantage of freedom from serum reaction. The spectacular results reported by Klenner in parenteral vitamin-C therapy are perhaps attained by reason of the fact that a much higher tissue level of the vitamin is possible by this method than by oral intake.

Rheumatic Fever. Abasy, Hill and Harris[11] found a striking difference in excretion of vitamin C in 107 active rheumatic fever cases compared with controls. They conclude that large amounts of this vitamin are indicated both prophylactically and therapeutically. Glazebrook and Thompson[12] studied the effects of hemolytic streptococcus infection in potentially scorbutic and control groups in 1,500 youths in a naval training school. Of these, 355 were given liberal daily supplements of ascorbic acid, the remainder being used as controls. There developed 16 cases of rheumatic fever and 17 cases of pneumonia among the controls, and no case of either disease among the youths who received the extra vitamin C. Rinehart[13] tried out the effect of combined vitamin C and P in rheumatic fever and found that all cases showed a slowing of the sedimentation rate which was paralleled by marked clinical improvement.

Whooping Cough. Otani[14] found that the intravenous use of vitamin C in 81 cases had a definite antagonistic action on the toxin of the Bordet-Gengou bacillus. Ormerod et al.,[15] reporting on 29 cases treated by oral vitamin C, 500 mg. the first day and 200 mg. daily thereafter, noted a marked decrease in the intensity, number and duration of the characteristic symptoms.

Puerperal and Infant Mortality. It is the author's belief that the gradually increased use of citrus fruits and tomato juice in the maternal (prenatal) and infant diet during the past half century has been the major factor in reducing death rates in these classes. The increased intake of vitamin C would, for the physiological reasons previously stated, tend to minimize the danger of puerperal infection, decrease the incidence and severity of pre- and post-partum hemorrhage, and, by increasing the tensile strength of connective tissues, prevent striae gravidarum and laceration of the birth canal[16], thus further lessening the danger of infection. In the infant this dietary revolution would tend to reduce the incidence of neonatal pneumonia, diarrhea and enteritis, and other infectious diseases of early infancy.

In the author's private practice during the past ten years, over

5,000 tests for vitamin-C status have been made, employing the dichlorphenol-indophenol color test on the urine. In many cases of deficiency, where the dietary intake indicates a subnormal intake of vitamin C over a lengthy period, the correlated clinical history shows repeated occurrence of infectious processes, such as tonsillitis, pharyngitis, otitis, bronchitis, mastoiditis, cystitis, pyelonephritis, phlebitis, appendicitis, cellulitis, cholecystitis, pneumonia, etc. During this period the author has made intensive application of vitamin-C therapy, orally and parenterally, in many such infectious diseases, including even septicemia and tuberculosis, with results in every case even more rapid and favorable than could be expected from the use of the modern antibiotics, and with the added advantage of complete exemption from toxic or allergic reactions. To illustrate: (1) An active case of tuberculosis was treated by the author as follows: 1,000 mg. of vitamin C intravenously, daily or every other day for three weeks, combined with 500 mg. orally in addition to copious intake of citrus juices. From the start the temperature was reduced and maintained at normal. The cough and expectoration have completely ceased, and a gain in weight of nearly ten pounds has been recorded. (2) A case of chronic pelvic infection, with frequent acute exacerbations for the past six years following a spontaneous abortion, was given 1,000 mg. of vitamin C intravenously, twice daily, for 2½ days (5 injections only). The W. B. C. count at the beginning of treatment was 19,200. A second count made on the third day showed a reduction to 6,700. The patient was then placed on an oral maintenance dose of 500 mg. daily in addition to a liberal intake of citrus juices. This patient has now been symptom-free for nearly a year. (3) A case of acute septicemia developed in an aged woman following an infected wound of the hand. When first seen there were marked swelling and redness of the hand and forearm and the temperature was 103° F., plus. 1,000 mg. of vitamin C was given hypodermically and 1,500 mg. orally, plus copious intake of orange juice. On the following day the inflammatory swelling and temperature were reduced to normal and the patient made a rapid recovery. (4) Several cases of scarlet fever were given vitamin-C therapy, intravenously and orally, 2,000 mg. daily. In each case the fever dropped to normal in a few hours and the patients were symptom-free within three or four days.

The author's experience leads to the conclusion that the principle

of trying to eradicate disease by concentrating our attack against the associated micro-organisms by means of toxic antibiotics is fundamentally unsound. If we wish to eliminate a desert or swamp we do not proceed to cut down the sage brush and cactus of the former or the lush characteristic verdure of the latter. Instead, we change the condition of the soil. By irrigation we make the desert blossom like a rose, and by drainage we change the flora of the swamp.

The late Dr. Alexis Carrel[17] has said: "Microbes and viruses are to be found everywhere, in the air, in the water, in our food. . . . Nevertheless, in many people they remain inoffensive. . . . This is natural immunity. . . . But natural immunity does not exclusively derive from our ancestral constitution. It may come also from the mode of life and alimentation. . . . Some diets increase the susceptibility of mice to experimental typhoid fever. The frequency of pneumonia may also be modified by food. The mice belonging to one of the strains kept at the Rockefeller Institute died of pneumonia in the proportion of 52 per cent while subjected to the standard diet. Several groups of these animals were given different diets. The mortality from pneumonia fell to 32 per cent, 14 per cent and even to zero, according to the food. We should ascertain whether natural resistance to infections could be conferred on man by definite conditions of life. Injections of specific vaccine or serum for each disease, repeated medical examinations of the whole population, construction of gigantic hospitals, are expensive and not very effective means of preventing diseases and of developing a nation's health. Good health should be natural."

A great English physician, Dr. Leonard Williams, has said: "The discovery of the vitamins has entirely altered our conception of the causes and origins of disease. Until lately disease was regarded as a sin of commission by some unseen and subtle agency. The vitamins are teaching us to regard it, in some degree at any rate, as a sin of omission on the part of civilized or hypercivilized man. By our habit of riveting our attention on microbes and their toxins we have sadly neglected the side of the question which concerns itself with our own bodily defenses."

Charcot has said: "Disease is from of old and nothing about it has changed. It is we who change as we learn to recognize what was formerly imperceptible."

SUMMARY

Statistical data are presented to show the marked decline in incidence and case-fatality of many infectious diseases within the past century. The uniformity of this decline suggests the operation of some major over-all factor improving natural resistance, compared with which our artificial control measures have played a minor or supplemental role. The existence of such a factor has been recognized by epidemiologists, but not yet identified.

The author advances the hypothesis that some major change in the trend of nutrition offers the most likely explanation, and singles out the greatly increased consumption of citrus and other fruits rich in vitamin C as the possible unidentified factor.

The physiological action of vitamin C is discussed in relation to its anti-infection role, and clinical evidence is cited from the literature relative to the prophylactic and therapeutic use of this vitamin in infectious diseases, in addition to the author's personal experience in this respect.

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16 *Gothic Avenue*

ACQUIRED HEMOLYTIC ANEMIA*

Report of Case in an Infant with Discussion of Several Etiological Factors Which May Have Been Operative

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The etiology of acute hemolytic anemia is varied, frequently complex and at best poorly understood.[1-15] Often no single factor can be incriminated. Hemolytic reactions have been known to follow the administration of sulfonamides[9-12] and blood transfusions[13-17b] and hemolytic crises have been observed in cases of atypical pneumonia.[12, 18-23] An infant with hemolytic anemia, which may have been produced by one or a combination of these factors, was observed by us over a period of 28 months. This case, which presented many perplexing manifestations, and the possible etiologic factors involved in its production form the basis of this report.

CASE REPORT

First Admission. A white baby girl, aged nine months, was admitted to Children's Hospital in Denver, December 10, 1944, because of anemia of five weeks' duration. At the age of seven months she had an infection of the upper respiratory tract for which she initially received sulfonamides without immediate ill effects. However, ten days later, because of pallor and listlessness, she was admitted to a community hospital where nine transfusions of 50 cc. each (ABO typed and crossmatched) were administered without incident over a period of thirty-two days. Repeated hemograms showed no beneficial effect. The Rh type of the patient's and donor's blood was not determined. The leukocytes ranged from 2,000 to 3,800 per cubic millimeter, with a normal differential except for ten per cent eosinophiles. The erythrocytes ranged between 1,500,000 and 2,500,000 per cubic millimeter despite the transfusions. One urine specimen was normal. It is interesting

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that the mother, while pregnant with this child, had a renal infection for which "sulfa drug" was given over a protracted period, in unknown dosages, and with no known ill effects.

Physical examination revealed generalized weakness and pallor, with liver palpable 2 cm. below the right costal margin. There was a palpable gland in the left submandibular region. The right ear drum was perforated but not inflamed or draining. The blood pressure was 90 millimeters of mercury systolic and 70 diastolic; she weighed 16½ pounds.

Complete hemograms at this time confirmed the diagnosis of anemia. The laboratory findings and transfusions administered during this admission are shown in Chart 1. Histologic examina-

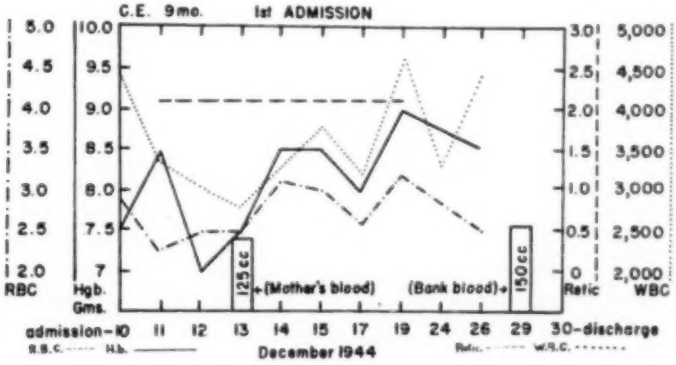

Chart 1. First Admission. The hemotologic values are shown as well as the effect of two transfusions.

tion of tibial marrow obtained at biopsy revealed erythroid hypoplasia with a normal maturation sequence in both the erythroid and myeloid series. Because of the satisfactory peripheral reticulocyte count of 2 per cent, there was believed to be no danger of immediate erythroid failure. The tip of the spleen became palpable several days after admission. Parenteral liver extract and vitamin C were administered. The patient's appetite improved, she gained 8 ounces and was afebrile. Of interest was persistent eosinophilia (6 to 18 per cent) without any demonstrable cause. ABO grouping and crossmatching was done with each donor's blood but no

Rh determinations were performed.* Her mother was again used as one of the donors. The diagnosis at the time of discharge was chronic, congenital, hypoplastic anemia.

The patients' general health continued unimpaired until after her second birthday. In this interval the blood was examined six times; there was a gradual increase in erythrocytes to 4,300,000 per cubic millimeter and of hemoglobin to 73 per cent (Sahli), as well as a gradual rise in leukocytes to 7,700 per cubic millimeter. The eosinophilia persisted, together with 70 per cent total granulocytes.

In March 1946, a persistent non-productive cough followed by bilateral suppurative otitis media developed. Satisfactory results followed the administration of penicillin in conventional dosage. Hemograms at this time were normal. Subsequently, anemia reappeared.

Second Admission. The patient was re-admitted July 2, 1946 at the age of 29 months, because of anorexia and vomiting for one week. She appeared well developed, undernourished, listless and anemic with mild jaundice of the skin and sclerae. The temperature was 100.4° F. (R), and she weighed 24½ pounds. The right ear drum was not draining. There was minimal posterior cervical adenopathy. The chest contained many machinery-like rhonchi with fine râles in the left pulmonary field and a friction rub along the left anterior axilliary line but these disappeared within a few hours; however, fine moist râles were heard from time to time. The edge of the liver and splenic tip could be felt at their respective costal margins.

During the first 24 days she received 13 whole blood transfusions ranging from 100 to 250 cc. each (Chart 2). She was determined to be group A, Rh negative and was given only compatible blood, from the hospital bank. No reactions occurred. The expected response was lacking and the steady decline in erythrocyte and hemoglobin content are shown in Chart 2. The mother, a previous donor, was found to have group A, Rh positive blood and therefore was unsuited as a donor. The fact that the reaction to the anti-Rh agglutinin slide test was positive on two occasions denoted previous sensitization. During the first 15 days there were no demonstrable reticulocytes in the peripheral blood. Repeated differential counts revealed a predominance of granlo-

*This occurred about the time satisfactory Rh testing serum was made available. Subsequent to this time all donors and recipients have been Rh tested.

cytes, many non-filamented and metamyelocyte forms but no eosinophiles. Daily urinalyses were negative. Roentgenograms of the chest showed bilateral and symmetrical exaggeration of hilar and bronchovascular shadows. There were no calcium deposits or evidence of enlarged nodes. The interpretation was "chronic non-tuberculous peribronchitis."

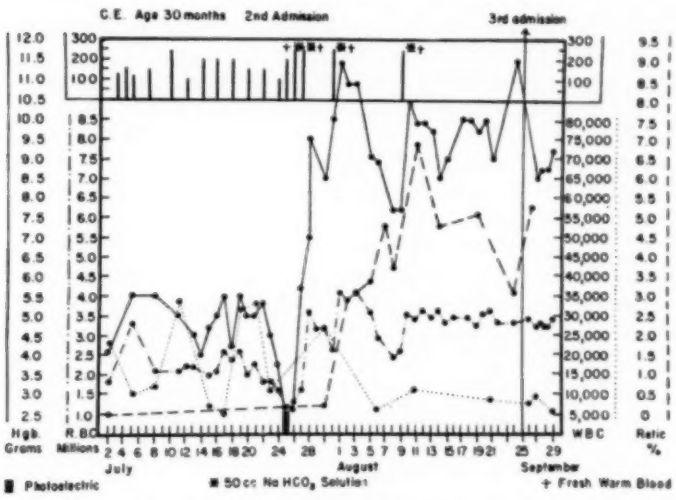

Chart 2. Second Admission. The ineffectiveness of bank blood on the peripheral hemogram is shown, together with the results obtained from fresh warm blood (and 5% $NaHCO_3$ solution). Photoelectric refers to the hemoglobin determination on day indicated.
Third Admission. These values appear at the extreme right.

Examination of bone marrow biopsy obtained on the eighth day showed a normal maturation sequence of the myeloid series, normal platelet formation, with severe depression of the nucleated erythroid series. The only cells of this group present were pronormoblasts and a few early erythroblasts. It should be noted that reticulocytosis was still absent. The slight jaundice was believed due to the multiple transfusions. There was nothing to suggest leukemia, either peripherally or in the bone marrow specimens. The findings were again interpreted as being consistent with a diagnosis of chronic hypoplastic anemia, a congenital defect.

Administration of folic acid daily and crude liver extract twice weekly resulted in no tangible evidence of improvement. Penicillin had little effect. Early in this hospital course it was reported that the venous blood underwent auto-agglutination.. This was considered a manifestation of auto-agglutinins or "cold" agglutinins associated with a typical virus pneumonia, and such agglutination was believed to be at least partially responsible for the repeatedly ineffective transfusions. The "cold" agglutination titre was found to be complete at 1:80 and partially complete in dilution of 1:160. This prompted the use of fresh warm blood transfusions (250 cc. on 25th, 26th, 30th and 38th hospital days). Fifty cubic centimeters of a 5 per cent solution of sodium bicarbonate were given simultaneously with each of these transfusions to prevent the precipitation of acid hematin crystals in the kidney.[25] The response was dramatic, as shown in Chart 2. Three or four days following the second fresh warm blood transfusion she was able to sit up in bed, the general improvement was excellent, the appetite good, and she became afrebrile. Folic acid was discontinued after the third warm transfusion. Both the liver and the spleen were now moderately enlarged. On three occasions traces of hemoglobin without erythrocytes were found in the urine. The peripheral blood picture remained normal after the last transfusion and she was discharged on August 22, 1946.

In the out-patient department, two weeks later, the examination was highlighted by the maintenance of the formed elements of the blood at or above the discharge level. A roentgenogram of the chest demonstrated the persistance of inflammatory changes along the right descending broncholvascular trunks, with less pronounced changes in the left pulmonary field. Peribronchitis was the impression; however, bronchiectasis could not be excluded.

Third Admission. Because of the harassing, dry nonproductive cough she was readmitted on September 25, 1946. There was no pallor, listlessness, fever or jaundice and she was in excellent spirits. She had gained three pounds. The chest contained showers of medium moist râles with bilateral fremitus. The spleen was enlarged 3.5 cm. below the left costal margin, not tender or hard. Hyperplasia of both the erythroid and myeloid series, with normal sequence and maturation, were demonstrated in the bone marrow specimen obtained at biopsy. The marrow reticulocytes were 9.1 and peripherally, 5.3 per cent.

A four-day trial on sulfadiazine failed to produce immediate or delayed deleterious effects on the peripheral blood.

Bronchography following the instillation of lipiodol was not entirely satisfactory, as only the posterior portions of the lower lobes were visualized; no bronchiectatic areas were visualized. Results of Mantoux and histoplasmin skin tests were repeatedly negative.

Examination	Second Admission July 2, August 22, 1946	Out-Patient Sept.5, 1946	Third Admission Sept.23, Oct.2, 1946	Fourth Admission Oct.26, Oct.31, 1946
Erythrocyte fragility	Normal			Begin 0.54% NaCl Complete 0.40%
Prothrombin activity	Normal		100%	97%
Bleeding time	Normal			Normal
Coagulation time	Normal			Normal
Cell Indices	Normal			CI - 0.94 SI - 0.97 CV - 70% MCH - 30.0 μμgram MCV - 80.5 cu.micra MCHC - 36.5%
Anti-Rh agglutinins	2+ Complete 1:80 Partial 1:160	1:16 1:160 1:320	1:16 albumin 1:320(also Mother)	1:64 albumin 1:512(not active above 8° C.)
Cold agglutinins			1:512 @ 4° C. 1:256 @ 10° C. Neg. @ 25° C. Neg. @ 37° C.	
Hemolysins			None in saline	
Icterus Index	5		13	5
Van den Bergh	Negative		Negative	Negative
Total serum bilirubin	0.8 mgm %		1.1 mgm %	0.6 mgm %
Serum proteins	7.1 grams		Normal	
A/G ratio	1.82:1		Normal	
Sulfadiazine blood level		9.5 mgm% after 4 days.		
Urobilinogen urine				Negative

Table 1. Laboratory observations from July 2 to October 31, 1946.

Subsequent hemograms disclosed moderate normochromic, microcytic anemia with normal platelet, white and differential cell counts. For the first time a few nucleated erythrocytes were seen in the peripheral blood. The titre of "cold" agglutinins as well as familial studies into her Rh status are shown in Table 1.

Throughout this brief hospitalization the cough and anorexia

persisted. Slight pallor, weakness and irritability had developed. However, the thoracic symptoms and signs improved and she was discharged after five days to return in two weeks. Re-examination revealed a liver and spleen thought to be gradually enlarging.

Fourth Admission. The patient re-entered the hospital three weeks later because of otitis media. The persistent hacky cough, low grade fever and good color were evident. Both ear drums were reddened but not bulging; the old perforation of the right ear drum was visible without drainage. The chest, liver and spleen were the same as before. Moderate generalized glandular enlargement was apparent. Intramuscular penicillin reduced the temperature to normal within 24 hours. During the six days in the hospital the only change in the hemogram was the unexplained reticulocytosis of 12.1 per cent. The results of urinalyses remained negative. Repeated stool examinations yielded no evidence of intestinal parasites. The diagnosis had been changed to hemolytic anemia of unknown etiology.

A roentgenogram of the sinuses revealed bilateral clouding of the ethmoids and the right antra, indicative of an infectious process. The ethmoids were considered possible foci for the pulmonary changes, although repeated attempts to demonstrate postnasal drainage were unsuccessful. Radiologic examination of the chest showed no change. An allergic reaction, probably in the sinuses, was postulated as a cause for the persistent eosinophilia. The sinuses were heavily infected. She was discharged October 31, 1946 and daily postural drainage was advised.

On December 14, 1946 she appeared in good health. A few fine crepitant râles remained in each lower lobe and the spleen and liver remained palpable as before. The peripheral blood was satisfactory. The urine contained a trace of albumin and chemical blood.

Fifth Admission. A progressive downhill course began shortly after Christmas and she was readmitted on January 7, 1947 because of vomiting and diarrhea for twenty-four hours. There had been a gradual increase in pallor during the preceding 12 days with increased cough. Icterus of skin, sclerae and mucous membranes were more noticeable than previously. Her temperature was 100.6° F. (R), pulse 110 per minute, blood pressure 90 systolic and 62 diastolic millimeters of mercury and she weighed 27 pounds.

There was a purulent exudate bilaterally beneath the nasal inferior tubinates. Both pulmonary fields contained many fine crepitant moist râles. The spleen and liver were palpable 3.5 and 2.5 cm. below their respective costal margins.

Recurrence of the anemia was evident. The reticulocyte count was 19.3 per cent and the platelets were 51,000. In Table 2 and Charts 3 and 4 are shown the various laboratory results and effects of therapy. Roentgenograms of the chest showed reactivation of the inflamatory process around the right hilus, not as diffuse as earlier, but hazier.

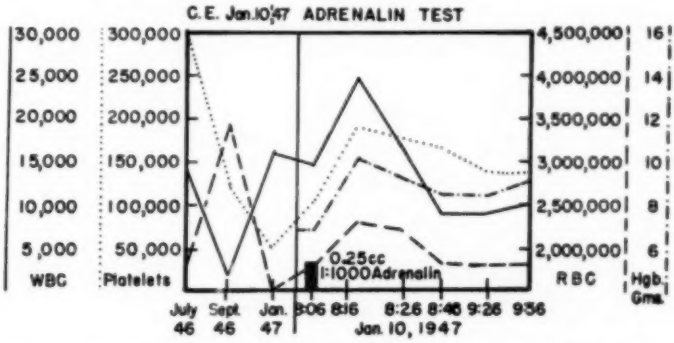

Chart 3. The response to subcutaneous injection of adrenalin hydrochloride, by time intervals, is shown. A summary of previous peripheral blood examinations precedes the adrenalin test.

The child was seen in consultation by Dr. H. D. Palmer* who believed that she had a chronic hemolytic anemia and advocated an adrenalin tolerance test, possibly to be followed by splenectomy. The adrenalin tolerance test[29] showed definite though not pronounced results. There was an associated slight increase in erythrocyte fagility but no microspherocytosis was observed.

She was seen in consultation by Dr. George B. Packard** who felt splenectomy was indicated and this was done on January 14, 1947. No accessory spleens were found. Minimal splenic contractions were observed following the injection of 0.25 cc. of 1:1000 solution of adrenalin hydrochloride. Within minutes of removing

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**Chief of Surgical Staff, Denver Children's Hospital and Professor of Surgery, University of Colorado, School of Medicine.

the spleen there was a sharp rise in the peripheral erythrocytes (Chart 4). A transfusion of 500 cc. of fresh warm blood was begun during surgery. Smears from the cut surface of the spleen, which weighed 217 grams, revealed extensive phagocytosis of erythrocytes by the macrophages in the spleen in both supravital and fixed stained specimens (Fig. 1).

The immediate postoperative course was uneventful. On the

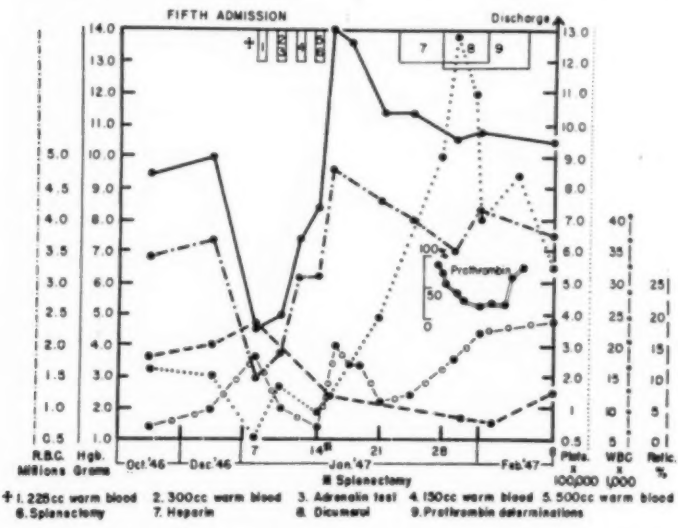

Chart 4. Fifth Admission. Shows the dramatic effect of splenectomy as well as the prothrombin determinations.

tenth postoperative day the platelets began to rise and continued to a peak of 1,278,000 per cubic millimeter on the sixteenth day. The continuous intravenous administration of heparin was then instituted with only a transient effect on the coagulation time (Lee and White). On the fifteenth postoperative day the administration of dicumarol was begun as prophylaxis against thrombosis. The prothrombin level fell promptly from 97 per cent of normal to 24 per cent of normal on the fourth day of dicumarol therapy (Chart 4). The dosage was varied to meet the demands as reflected by the daily prothrombin levels. The platelets gradually stabilized

between 500,000 and 650,000 per cubic millimeter. Five days before discharge the reticulocyte count was 7.7 per cent.

During the last eight days in the hospital with the Proetz drainage, the cough decreased. Three weeks following splenectomy she was discharged with a good appetite, enormous energy, and a clear complexion. She was considered "cured," at least temporarily, and she was to return in 3 to 6 months.

Sixth Admission. After five days at home the fever, anorexia, vomiting and diarrhea recurred. The temperature rose to 104° F. (R) the day before readmission on Feb. 17, 1947. No icterus had appeared; however, the fingernails were being shed, and

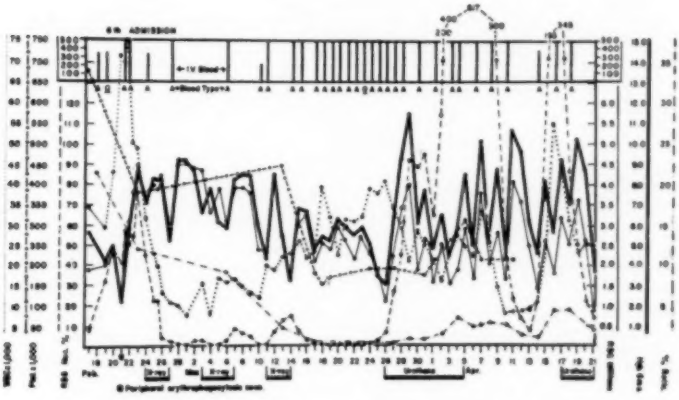

Chart 5. Sixth Admission. The stormy progressively downhill course is evident. The high normoblastemia percentage is indicated as is peripheral erythrophagocytosis. Across the top appear the transfusions; figures at right and left refer to amount of blood given in cubic centimeters.

a moderate weight loss was apparent. The right and left ear drums were bulging. The nasal mucosa was injected and there was a thick mucoid drainage bilaterally without postnasal drainage. Both pulmonary fields revealed a few rhonchi; no râles or dullness were noted. The liver was enlarged as before. Table 2 and Chart 5 show laboratory values and therapeutic attempts.

The course through this admission was radically febrile. For the first time normoblastemia was noted, first rather infrequently,

then progressing to high values observed almost daily. Thirty-three whole blood transfusions were administered during period (Chart 5) using group A, Rh negative blood (on two occasions it was group O, Rh negative). The blood was always kept warm and frequently accompanied by 50 cc. of a 5 per cent solution of sodium bicarbonate. Of these transfusions, 28 were of 500 cc. volume.

Examination	Fifth Admission Jan. 7, Feb.8,1947	Sixth Admission Feb. 17, April 21,1947
Erythrocyte fragility		2/1/47- Begin 0.4%, complete 0.42% 3/24/47-Begin 0.70%, complete 0.50%
Prothrombin activity	See Chart III	Normal
Bleeding time		Normal
Coagulation time		Normal
Cold agglutinins	complete 1:640	2/18/47 complete 1:80
Icterus index	23	3/25/47 -141 4/1/47 -288 4/15/47 - 46
Total serum bilirubin	2.4 mgm %	3/25/47 T- 13.6mgm%; D- 9.6mgm% 4/1/47 T -48.0mgm%; D- 39.0 mgm% 4/15/47 T - 5.8mgm%; D- 3.0 mgm%
Serum protein		2/17/47 - 8.0gram
A/G ratio		2/17/47 - 2.2:1
Cephalin floculation	2+ @ 24 hrs. 3+ @ 48 hrs.	
Urobilinogen urine	0.8mgm/24hr.	
Urobilinogen stool	68.1mgm/100 gm. wet weight stool	Terminally stool very foul, black
Hemolysins	none - saline	3/15/47- none in saline diluent.

Table 2. Laboratory observations from January 7 to April 21, 1947.

The administration of penicillin in conventional dosage was begun on admission and continued for four weeks; streptomycin was then given for six days. Neither antibiotic altered the course of the disease to any extent. Cultures of discharge from the right ethmoid yielded a heavy growth of hemolytic staphylococcus aureus on blood agar. This organism proved sensitive to 12.5 but not to 6.25 units per cubic centimeter of penicillin. A culture taken one week later was negative for the hemolytic staphylococcus.

Erythrophagocytosis was noted for the first time in the peri-

pheral blood four days after admission (Fig. 2). This persisted and some degree of peripheral erythrophagocytosis was noted in subsequent differential counts. At this time she was moribund and in a severe hemolytic crisis. She received two large transfusions (500 cc. each) within 36 hours. Therapeutic roentgen ray irradiation (Chart 5) was instituted in the upper part of the abdomen through anterior and posterior ports. It was now thought that the abdominal lymph nodes had begun to assume splenic function. The liver was

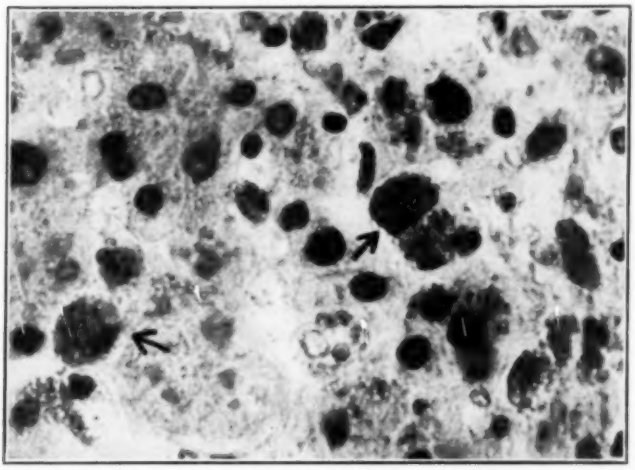

Fig. 1. Photomicrograph of active phagocytosis of erythrocytes by macrophages in the spleen, removed surgically. From a fresh cut section —Wright's stain.

firm, non-tender and enlarged 4 cm. below the right costal margin. Some improvement became evident and roentgen therapy was repeated five days later and the inguinal nodes were included. Irradiation was again repeated four days later, resulting in a pronounced reduction of nucleated erythrocytes and reticulocytes. Even so, she was in extremis with severe hemoglobinuria. During the next two weeks she received 500 cc. of compatible blood daily, resulting in equivocal transient improvement.

Such improvement was short-lived. Urethane was then given by rectum for 10 days. During the first few days there was a dramatic

rise followed by a sharp drop in the number of nucleated erythrocytes in the peripheral blood accompanied by disappearance of the erythrophagocytosis and gradual increase in reticulocytes; it was possible to maintain the erythrocyte level with transfusions every other day. Attempts were successful in keeping all blood transfusions at body temperature. However, the nucleated erythrocyte count rose sharply on April 15 and urethane was given at this time without improvement.

The amount of right ethmoid drainage appeared to increase as did the fever during periods of acute hemolytic crisis. During

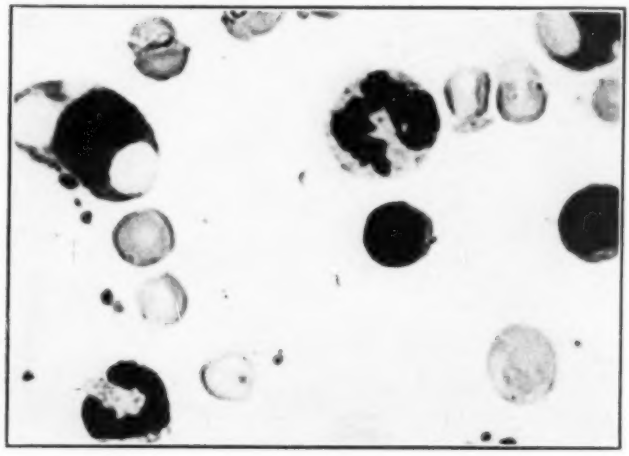

Fig. 2. Photomicrograph of peripheral erythrophagocytosis—Wright's stain.

the last month of hospitalization, the stools became foul and were frequently black and slimy. Two stool cultures revealed occasional colonies of nonhemolytic staphylococcus. Repeated fecal examinations for fat, starch and parasites had been negative during each admission.

Following the second severe hemolytic crisis, the jaundice intensified, all the fingernails were lost, and severe alopecia developed. On April 20 the erythrocytes numbered 2,500,000 per cubic millimeter, the hemoglobin was 55 per cent (Haden-Hauser) and

leukocytes 24,000 per cubic millimeter with only 20 per cent nucleated erythrocytes. However, on April 21, 1947, before a transfusion could be started, the erythrocytes suddenly dropped to 750,000 per cubic millimeter, the hemoglobin was too low to read (photoelectric) and the child expired.

Necropsy was performed except the head. The mucous membranes were very pale. A submandibular tumor of soft consistency, 3 cm. in diameter, was noted. There were numerous soft discrete lymph nodes in both anterior and posterior cervical areas. The skin of thorax, abdomen and upper fifth of each thigh bore a peculiar olive cast. The subcutaneous tissues and costal cartilages were intensely yellow. The liver edge extended 5 cm. beneath the costal margin.

The trachea and main stem bronchi were clear of fluid. Numerous large tracheal lymph nodes were present—2 cm. in diameter. The heart and lungs were grossly normal. The liver weighed 917 grams (expected weight 534 grams), was dark red, soft and flabby with distinct lobular markings. The extrahepatic billiary system was patent.

No evidence of portal vein thromboses was found. The adrenals appeared normal and weighed 4 grams. The kidneys together weighed 123.5 grams and were very pale red. Numerous large mesenteric lymph nodes were similar to the tracheal nodes. On section, the manubrium exposed a very large, deeply red colored bone marrow.

Microscopically the lungs showed all bronchioles to be filled with a mucopurulent exudate.

The liver was marked by hemosiderosis: however, no generalized change was seen indicative of cirrhosis.

The spleen (removed surgically) revealed a marked diminution of lymphocytes with high phagocytic activity in the germinal centers of the Malphighian corpuscles. The pulp was voluminous with heavy hemosidrin deposits. The reticulo-endothelial cells were prominent and many contained intact red blood cells.

The kidneys showed that the endothelial cells of the glomeruli contained granular brown pigment. Intravascular hemolysis in the kidney was indicated by presence of free pigment in the loops of the glomerular capillaries. A few were completely hyalinized. The tubules were not dilated and casts were absent but focal areas

showed degeneration; these changes occurred in the distal portion of the nephron.

The bone marrow revealed an increase in lymphocytes with a definite decrease in the nucleated cells of the erythroid series; megakaryocytes were normal in number and morphology.

Marked hyperplasia of the reticulo-endothelium, often laden with blood pigment and filling the sinuses, characterized all the lymph nodes. No alteration toward neoplasia could be determined in multiple sections. Some of the nodes approached splenic pulp in appearance.

The section from the submandibular gland showed normal glandular tissue with an adjacent cystic inflammatory lesion, containing mucin and thick yellow fluid with long fine hairs, without calcification.

SUMMARY

A fascinating complex case presenting the problem of hemolytic anemia and chronic infection was followed for 27 months. During this time remissions and exacerbation were common, the remissions becoming progressively shorter as the course lengthened.

Although we do not intend to make definite conclusions it may serve a purpose to express our thoughts concerning the etiological aspects. As a portion of the pathogenesis, one cannot exclude the possible relationship between the sensitivity to sulfonamides and erythroid-hypoplasia. To be sure, our trial of sulfadiazine was not followed by immediate adverse results; however, acknowledgement is made of the possible association of the reduced marrow function during the final phase of the illness and the trial of sulfonamide.

Certain immunological responses are established in primary atypical virus pneumonia. Noteworthy among these are the cold hemaglutinins. The titre of these antibodies rises to high levels in many cases. A diagnostic level as defined by the Committee on Respiratory Disease[20] was reached in our case. Hemolytic crises have been observed in cases of atypical pneumonia (virus) as noted earlier[21]. Certainly evidence for some type of nonspecific respiratory infection was abundant in our case. The cough, fever, radiological evidence of chronic bronchitis and sinusitis, together with failure of the infection to respond to antibiotic therapy strongly suggest the possibility of virus etiology.

Although this child was immunized to Rh positive blood, it

is doubtful that this immunization played anything more than a temporary part in the course of the illness. After it was discovered that she was a homozygous Rh negative, which was rather early in her course, she received only Rh negative blood. It is, therefore, inconceivable that the Rh antibody could have had any part in the major portion of her course. Her own cells were Rh negative and she was receiving Rh negative blood; therefore, there was no antigen upon which the antibody could act. It is also true that her anemia had developed prior to any transfusions, therefore, the disease had been initiated before she was immunized. For this reason Rh iso-immunization very probably had no part in the initiation of the disease of her blood.

The auto-agglutination noted early probably was related to the production of cold hemagglutinins. No conclusions are attempted but it is pointed out that the successful use of fresh, warm blood, at times with added 5 per cent soda bicarbonate solution, indicate that the cold agglutinins may have played a primary role. No hemolysins were demonstrated; Dameshek and Schwartz[27] demonstrated hemolysins in their case. Unfortunately our case was studied and died before the Coomb's test[28, 29] became widely known. Although the 5 per cent soda bicarbonate was not used with each transfusion it is interesting to note the apparent clinical sparing of the kidneys.

The anemia could have been produced by any single factor or by any combination of factors enumerated above; or by unknown or unrecognized agents. With the information at hand we feel that a combination of factors is most plausible. Hypoplasia of bone marrow (erythroid elements) is a known complication of sulfonamide therapy as is production of cold agglutinins. The case illustrates the fact that when erythroid hypoplasia coexists with a hemolytic process, many of the features of hemolytic anemia, notably the reticulocytosis, may be absent.

Anoxia increases erythrocyte regeneration and produces marrow hyperplasia[30]. Evidence of anoxia was present during the final hospital course, and was due to the anemia and chronic pulmonary pathology. The use of oxygen was necessary during a great part of her last hospital stay.

The erythrophogacytosis in this case resembles somewhat that seen in a case of acute hemolytic anemia (of the Lederer-Brill

type) as reported by Landolt[31]. It probably represents simply an extension into the blood stream of the active phagocytosis which was in progress in the reticulo-endothelial system.

Periarteritis nodosa, visceral angitis, atypical Hodgkin's disease or a bizarre leukemic process were given careful consideration. Pathological investigation failed to reveal characteristics diagnostic of these conditions. It is hoped that the case record will contribute something in the direction of the study of hemolytic anemias.

Acknowledgement is made to Dr. Harold D. Plamer, Pathologist and Medical Director of Denver Children's Hospital for his advice in the study of this case, as well as his interpretation of all bone marrow specimens.

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HUMAN HYPERIMMUNE SERUM IN WHOOPING COUGH. (Nordisk Medicin, Stockholm, 43:784, May 12, 1950). Johnsson and Lundström carried out passive immunization with hyperimmune serum in 23 infants exposed to whooping cough. The prophylactic dose was 20 ml. Two prophylactic doses were administered, one on identification of the source of infection and one six days later. Of the 17 infants isolated after the first prophylactic treatment, two had an atypical cough of brief duration and 15 remained well. Of the six who continued in contact with the source of infection, 5 had whooping cough, four with a mild and one with a normal course. In 30 children under two years of age with clinically established whooping cough, treatment with two or three prophylactic doses of hyperimmune serum at 48 hour intervals was without appreciable effect on the course of the disease and did not prevent complications.—*Journal A.M.A.*

THE MALADJUSTED CHILD

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Children, just like adults, may deviate from normal behavior. They may indulge in actions which are not socially useful or socially acceptable. Quite often they will not act in the best interests of the group in which they move. This type of disturbing behavior of the child is directed toward one of four possible goals, according to Dr. Rudolf Dreikurs. The maladjusted child acts in the way he does to 1. Gain attention. 2. Demonstrate his power or superiority. 3. Punish or get even, and 4. Gives up in complete discouragement.

The great majority of children use some methods of getting attention. They do this because they feel they have to. Young children cannot attract attention to themselves by doing something socially useful. The only way a young child can feel accepted and a part of his family is by means of the older members of the family. Most children feel that they must have constant proofs of their acceptance. This he gains by demonstrations of affection or by directing attention toward himself. However, none of these methods usually increase his feelings of strength, self-reliance and self-confidence. He still feels somehow that he requires constant new proofs that he is still being accepted. At first he will try socially accepted means of gaining this attention. When these fail he will begin to employ methods that are not regarded as socially acceptable.

Even if these methods of gaining attention bring punishment, the neglected child will gladly accept this punishment. Most children prefer to be beaten rather than ignored. To be ignored and treated indifferently is the worst thing that can happen to a child.

After having tried legitimate and socially acceptable methods of gaining attention and having failed the child will embark upon a course of action that is disturbing and annoying. For a while the parents may tolerate these actions without provocation. However, if these actions persist, the parents lose patience and punish him for his actions. At this time the child changes his goal, and the child and the parents become deadlocked in a struggle for power and superiority. The child tries to convince his parents that he can

do what he wants and they will not be able to stop him. Or he may seek to demonstrate that his parents cannot bend him to their will. If he succeeds in this way he has won his point; he has gained attention and his goal. If he does not succeed, he will use other and stronger methods to attain his goal. His maladjustment becomes more obvious, his actions are more hostile, and the emotions involved are more violent.

If neither side gives in in this struggle between child and parents, the struggle grows more intense. The parents use all sorts of methods to punish and subjugate the child. This mutual hatred and antagonism becomes rather intense. It may become so strong that no pleasant experience is left to maintain a feeling of belonging, of friendliness or cooperation. When this has occurred the child becomes vengeful. He wants to hurt others, to get even. He no longer hopes to gain attention. He feels ostracized and disliked and finds his only gratification in hurting others. If he cannot make them love him, he can make them hate him. Children of this type are the most violent and vicious. They know where it hurts most and they take advantage of the vulnerability of their opponents. Power and force impress them no longer. They are defiant and destructive. As they are sure from the beginning that nobody loves them, they provoke anyone with whom they come in contact to reject them. They regard it as a triumph when they are considered nasty. That is the only triumph they can obtain, the only one they seek.

The child who is inclined to be passive will not engage in open warfare. If his antagonism is successfully beaten down, he may be discouraged to such an extent that he cannot hope for any significance whatsoever. He gives up entirely. As the hostility is not openly shown, he may provoke less antagonism. However, this lack of acute disturbance does not mean that his maladjustment is less grave than the child who is openly hostile. Both are indulging in socially acceptable actions.

According to Dr. Dreikurs, maladjusted children may be classified as active and passive and they may use constructive or destructive methods. The choice of constructive or destructive methods depends on the child's feeling of being accepted or rejected by people or groups. His antagonism is always expressed in destructive acts. In the main, it is this feeling of acceptance or rejection

which is the decisive factor in swinging from constructive to destructive methods. On the other hand, active or passive behavior indicates the amount of courage. Passivity is always based on personal discouragement. Thus, according to Dr. Dreikurs, the combination of the two pairs of factor leads to four types of behavior patterns:

1. Active-constructive.
2. Active-destructive.
3. Passive-constructive.
4. Passive-destructive.

The above sequence is based on the actual progression of maladjustment. The tendency is to regard an active-destructive child as much worse than a passive-constructive one. This is not always true. If the child's antisocial attitude has not developed too far, as in cases of attention-getting, he can be induced with relative ease to change his destructive methods into constructive ones. However, it is very difficult to change a passive child into an active one. The passive-constructive child is less of a nuisance. However, he certainly needs more assistance in developing courage and self-confidence.

The active-constructive children are much appreciated by all with whom they come in contact. Actually they are not as good as they seem to be. They are trying very hard to make an impression of excellence in order to gain praise and appreciation. Should they fail to get it, their shortcomings are immediately noticeable. They start to misbehave. They are not content merely to be equals. They feel that they must excel; if they do not, they feel lost. Their desire for perfection, for propriety and superiority is often fostered by parents who encourage such traits.

There is no doubt that this group of over-ambitious children develop active destructive methods when their efforts to attract attention with methods that are socially acceptable fail. They often try the most unusual ways to push themselves forward when they are encouraged in the field of useful achievement. They become "show-offs," clowns, obtrusive. They use all the methods they can think of to attract attention to themselves. Their misbehavior is a mechanism of attracting attention and when this goal is attained, they become normal behaving children again.

Another rather important group consists of children who use passive-constructive methods to gain attention. So subtle are their actions that many parents and teachers do not recognize these chil-

dren as misbehaving. They are very pleasant, full of charm and quite submissive. These traits are found more in girls than in boys, and when boys have them they are considered effeminate. In spite of the fact that this type of child is not as unpleasant as the active-destructive one, he nevertheless requires more effort for adjustment.

A child who seeks attention with passive-constructive methods is generally so much discouraged and feels so much rejected—mostly through the methods which are used with him—that he becomes completely frustrated and discouraged. His bashfulness, untidiness, instability, lack of concentration and ability, self-indulgence and frivolity, his fearfulness, his eating difficulties, and his backwardness in taking care of himself and in developing skills, make him the most difficult child in this group.

The child does not know why he behaves in a certain way. It is useless to ask a child, "Why did you do it?" When he answers, "I do not know," it is generally true. The child follows his impulses without a clear realization of his motives. If he tries to give an explanation for his behavior, his explanations are most rationalizations and excuses, but not the real reasons. Instead of asking the child why he did something, one must explain it to him. The child should be made aware not of the cause but the purpose of his behavior. Reasons such as being jealous, lacking self-confidence, feeling neglected, feeling guilty or rejected are of little meaning to the child. His reaction is entirely different when his purposes and goals are disclosed to him. He may not acknowledge that this is so verbally, but his expression gives him away. Disclosure of this kind leads to an immediate change in the particular behavior, especially in a young child.

The child must be approached in a friendly way without belittling him. The disclosure should never impress the child as fault-finding. It is advisable not to make a definite statement, but to start the remark as a vague conjecture: "I wonder if you don't want to get some attention?"; "to show that you're the big boss"; "to punish your mother."

When the child's goal in his misbehavior is recognized, treatment is begun. Children who drive for attention must learn to become independent, by recognizing that contributing and not receiving is the most effective way to attain social status. An

attempt should be made to help children to become active and to change destructive methods into constructive ones, until the child is able to overcome the need for any special attention.

Children who drive for power should no longer be exposed to power and pressure against which they have successfully rebelled and still rebel. By acknowledging their value and even their power makes them self-confident so that they no longer require verification of their power. Children who want to punish and get even are usually those who are convinced that nobody likes them or will ever like them. Helping them involves a long process of demonstrating that they are and can be liked. Children who give up in discouragement have to be brought back slowly to the realization of their abilities and potentialities.

The recognition of the child's goal is an important step forward in reeducating him along the proper lines. However, according to Dr. Alfred Adler, knowing and even changing the goal of a child does not necessarily affect his fundamental concepts of life. Understanding and altering the conclusions which a child can draw from his experiences with the world around him, his external environment, his internal environment, requires a more thorough analysis of the child.

The knowledge of a child's goal permits a better approach and, above all, prevents unwitting acceptance of the child's provocation which only increases his maladjustment and misbehavior. Doing what the child expects, confirms his belief that his wrong approaches are effective.

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SODIUM CAPRYLATE TREATMENT FOR THRUSH

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The purpose of this paper is to confirm and to advance the report of Keeney[1] that sodium caprylate is an effective fungicide in the treatment of thrush. He reported dramatic results in seven cases.

Sodium caprylate is a salt of a fatty acid. The fatty acids were first introduced by Peck and co-workers[2] in the treatment of mycotic infections. We had observed that some of our thrush cases in the nursery were not responding to the usual gentian violet therapy. In fact some of the gentian violet treated cases gave an additional glossitis, such as glistening pearly lesions, which was attributed to the irritation from the drug. We had access to sodium caprylate* which we were using in the study of coccidioidomycosis[3] and we decided to take advantage of this situation too.

We had a series of 12 cases of thrush of which three were treated by pediatricians on the outside. One of the outside cases had a hard white matting on the tongue which came off in sheets during the treatment with 10 per cent aqueous sodium caprylate. This series also included four premature infants of which one had the disease from the third day of life. We used 10 per cent aqueous sodium caprylate and always insisted that it be used firmly on rubbing the buccal and lingual tissues about four times a day. Four days was the average time of ridding the mouth of this fungus. One case was not responding well and we noted that the fingers were always in the infant's mouth. By restraining the hands the treatment responded well as reinfection route was cut off.

The ages of the cases varied from 3 days to 12 months. We had no recurrences and are now using this fungicide as standard therapy in our nurseries and on the outpatient department.

SUMMARY AND CONCLUSIONS

Fatty acids are established fungicides. A 10 per cent aqueous solution of sodium caprylate cleared up 12 cases of thrush in an

*The Sodium Caprylate was donated by the R. J. Strasenburgh Co. of Rochester, New York, and Dr. J. A. Morrell of that company who made this work possible.

average of four days, no complications or recurrences were noted.

We feel that Keeney's original report on this treatment merits widespread usage as an effective and dramatic responding drug for the treatment of thrush.

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ANGIOCARDIOGRAPHY IN CHILDREN. (Archivos de Medicina Infantil, Havana, 19:29, Jan.-Feb.-March 1950). Castellanos and collaborators state that the child tolerates well injection of a radiopaque substance in sufficient quantity and concentration to obtain good angiocardiographic roentgenograms. The procedure is contraindicated in accentuated cardiac insufficiency. Serial roentgenograms are necessary for the correct diagnosis of cardiovascular lesions by angiocardiography; the radiologist must have considerable knowledge of the anatomic types of the abnormalities. Dextrocardiograms are of value in the diagnosis of abnormalities of the great veins, stenosis and idiopathic dilatation of the pulmonary artery, tetralogy of Fallot, Corvisart's disease, Eisenmenger and Taussig's complex, interventricular communication, total transposition of the great vessels, tricuspid atresia with associated defects, truncus arteriosus communis and pulmonary arteriovenous aneurysm. Levoangiocardiograms are of value in the diagnosis of abnormalities of the pulmonary veins, lesions of the mitral valve, coarctation of the aorta, patent ductus arteriosus, right sided aorta and aortic aneurysm, extrinsic compressions and torsions of the aorta. For diagnosis of the isolated defects of the septum both the dextroangiocardiogram and the levoangiocardiogram are necessary. Aortography is of value in the diagnosis of coarctation of the aorta, patent ductus, abnormalities of the large branches of the aorta, aortic insufficiency, truncus arteriosus communis and surgical arteriovenous anastomosis. Angiocardiograms should be obtained with a single injection of the contrast substance for the differential diagnosis between the cardiac and pericardiac shadows.—*Journal A.M.A.*

PEDIATRICS HALF A CENTURY AGO

From time to time the Archives, which was the first Children's Journal in the English language, will reprint contributions by the pioneers of the specialty over fifty years ago. It is believed that our readers will be interested in reviewing such early pediatric thought.

ANOREXIA NERVOSA IN CHILDREN*

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The peculiar affection which is the subject of this paper was first described by Laségue in 1873 under the name of "l'Anorexia Hystérique." Independently of him, Sir Wm. Gull described the same condition in 1874, giving to it the designation of "anorexia nervosa" because, as he says, it also occurs in males. In 1894 Collins and Soltmann reported the first cases in children, the latter adding another name for the condition—"anorexia cerebralis, or corticalis." The next year (1895) C. F. Marshall recorded a fatal case in a girl of eleven years of age in which the autopsy revealed the same absence of lesions as was found in Gull's fatal case (1896). Since that time the affection has been usually taken up in connection with hysteria, and it has been looked upon as one of the manifestations of hysteria.

The condition may be defined as one of anorexia, in neuropathic girls and boys, accompanied by loss of weight; sometimes terminating fatally with no organic lesion found. According to the present state of our knowledge, we are justified in calling it a neurosis or a psychosis. The anorexia may be complete or incomplete in that the patient takes no food at all or restricts himself to certain articles of diet. But there must be absence of organic lesion which would explain the anorexia.

According to this definition, those conditions found in spoiled, pampered children who live upon improper food, both as to quantity and quality, are not to be considered under the heading of anorexia nervosa; in them there is no loss of weight as a rule. Neither should the loss of appetite which accompanies the anemias, the gastrointestinal diseases, so-called scrofulosis or

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tuberculosis be considered under this heading. Notwithstanding the fact that here the anorexia itself may resemble that of the minor form of anorexia nervosa, there is always some other disease which explains the loss of appetite. As a rule the children who suffer from anorexia nervosa are such as have been permitted to grow up without discipline; eating much or little and choosing their own diet. The milder form of anorexia nervosa is represented in the following:

A. B., female, aged seven years. Both mother and father neurotic and of neurotic descent. Three other children in the family, one of whom is an idiot. Nothing abnormal was found in the child until she was six years of age, although the mother states that the child has an uncontrollable and violent temper. The child, furthermore, must have its own way, and always does have its own way. At the age of six she made up her mind that she could limit her diet to certain articles of food, and take small quantities of them. No reason could be assigned for this; she simply would not eat anything except meat, vegetables in small quantities and cheese or salad in large quantities. The two latter articles of diet were permitted by the indulgent parents, but only in small quantities. Constipation was the only thing complained of, aside from the loss in weight, sleeplessness and general unhappiness. When she was brought to me I found the following: A pale, emaciated child, weighing 34 pounds, the average weight for her age being 41 pounds. Physically, nothing wrong could be found; urine small in quantity, specific gravity somewhat increased, normal constituents normal, no abnormal constituents. The blood examination showed slight reduction in hemoglobin, otherwise nothing. Examination of the nervous system showed that she was suspicious, willful and very difficult to examine. It was only after the exercise of a liberal amount of patience that she permitted me to examine for the sensory stigmata of hysteria, which were found absent, in so far as one can say this about a child of this sort after one examination; I may add, however, that after she became better acquainted with me, repeated examinations in this direction showed that she was intelligent and consistent in her responses, so that I am justified in stating that these stigmata were absent. She was put upon the proper treatment and, after four weeks, was discharged

cured, having gained 9 pounds, eating all that was given her, her bowels moving normally and her sleep normal. All evidences of malnutrition were gone and the patient was acting as became a child of her years.

A second case, belonging to the same class, is the following:

M. X., female, aged twelve years. Both mother and father neurotic. The child was brought up on artificial food. According to the mother's account she had never been ill, but had never eaten like other children. She was in good condition until a year ago, when she began to limit her diet practically to pickles, salad and olives; if she was forced to take anything else it was promptly vomited, so that the parents refrained from making suggestions to the child. With this she began to run down, became languid, lost ambition, fell behind in her studies, and was mortally uphappy. She was far advanced in her studies, for her age, and besides her school work took extra lessons in additional studies in the direction of the higher education for women. Gradually she grew irritable and cross, began to make excuses in order not to go to school, lost weight, cried easily and slept badly. Her appetite was getting worse and worse and she was becoming more emaciated. One day in getting out of a street car she suddenly fell down, could not walk nor stand and had to be carried home. That night she alternately wept, moaned or screamed, saying that she did not want to die, but that "God was going to take her." The next morning I was called to see her and found the following: An emaciated, hollow-eyed, frightened and pale girl of normal development as to size, and in pubescense. She was lying in bed with her legs bent, but moving about in the bed whenever she desired to do so. Temperature normal, pulse and heart of the characteristic neurotic reaction. No evidence of organic lesion to be found; all the special examinations which were made showed nothing abnormal, except a slight increase in indican and a diminution in hemoglobin. While talking to her and asking her questions she broke out in floods of tears, off and on; this was associated with tossing of the head; then would come a period when she would become aphasic; this would pass into a stage of aphonia and finally she could talk again. When lifted out of bed she could neither walk nor stand; all attempts failed and she would immediately collapse with bent knees (astasia-

abasia). She complained of pains in her head, in her extremities and indeed everywhere, which were increased decidedly upon pressure. But even when there was no pain she was hyperesthetic. The knee jerk was increased and there were ankle clonus. In the course of the condition she became very much depressed, developed paralysis of the rectum and bladder, at times was violent, but always tried to have her own way in everything—when crossed there was a violent crying spell or a long period of sulking. She weighed 54 pounds (average weight of age and size, 68 pounds). She was put upon the proper treatment, gaining 16 pounds in six weeks, and being restored to health.

The severe form is represented by the following, which I saw in consultation with Dr. A. Friedlander. It has already been reported, so that I content myself with an abstract of his report. The case is of great importance for our discussion of the etiology of the affection besides being the youngest patient on record with anorexia nervosa.

G. W., male infant, one year old; the mother neurotic, the father and his family also. In addition, the father has had syphilis, many years before marriage. Child free from any syphilitic manifestations. It had eight teeth, weighed 25 pounds and had never been ill in any way. It was breast fed, and its mental development perfect. From the ninth month attempts were made to add artificial food which were unsuccessful in that the child would not take anything, although it always drank water from a cup. When the child was a year old, weaning was instituted, and because of the neutrotic mother this was entrusted to a trained nurse. But the child would not take food; it would nurse once a day and also take water. We then decided to remove the child from its mother, taking it to a hospital. For four days and nights nothing was given by the mouth, normal saline solution being given by the rectum in order to supply fluid. Then feeding was begun, the following foods being tried: milk, cocoa, gruels, cereals, hot food, cold food, warm mixtures, sweet mixtures, salted mixtures of various kinds—all to no avail; the child would drink water and nothing else. During all this time the child had lost three pounds, and it would not eat, gavage was resorted to. Eight ounces of a milk and barley-water mixture were given four times a day. This was kept up for two weeks

constantly, attempts at natural feeding being continuously made. At the end of the second week the child began to take some food; gavage was then not so frequently given. At the end of the third week the child took sufficient food, so that gavage was no longer necessary. After this, improvement was rapid, so that in another month the child was taking a variety of foods and had gained four pounds in weight. At no time was there any evidence of physical disturbance; indeed the child was normal. In "this respect the child even during its starvation period appeared perfectly contented, crawled about the floor of its room, played with its toys, enjoyed its daily outdoor ride, and slept well."

The fourth case—a boy three years of age, the only child of parents who had married late in life, both parents being neurotic—again represents the severe form. Aside from trifling bowel complaints and slight febrile attacks the previous history was negative. The father, a man of sixty, stated to me that neither he nor his wife believed in discipline in the bringing up of children, and it was his principle never to deny anything to his child, which had been lived up to in every respect since the child was born. For some time, however, the boy had been cutting off articles from his diet until at present he hardly ate anything. He would drink water, but at times he would hardly touch food for several days. When he ate at all, it would be to suck one or two pieces of fried bacon, possibly to swallow some of it, and to eat one-half of a banana. I found an emaciated child lying upon the lap of his mother, eyeing me with suspicion, but apparently not afraid of the doctor. When I began to examine him, however, he resisted with the remnant of strength left in him, and his parents joined issue with him. I finally succeeded, after the exercise of much patience, in having the child undressed to find a condition of emaciation that I have rarely seen. Upon weighing the child the next day it was found that he weighed only 18 pounds (average, 30 pounds). In addition, he had furuncles and other evidences of lack of care of the skin. No organic lesion was found. The child was exceedingly sensitive upon pressure, otherwise nothing was found which might be called a hysterical stigma. The pulse was weak and the temperature sub-normal (97° F. in the rectum); the urine that of starvation. The lower extremities were edematous and the face pale and slightly puffy. After a

careful study as to patient and surroundings I mapped out the course of treatment to be followed. The first and principal measure—removal of the child from the care of the parents—was met by an absolute refusal. Thereupon I withdrew from the case. Three weeks after this the child died from starvation.

A number of these cases might be cited, but these four have been chosen as typical examples from which, possibly, some deductions may be drawn as to etiology. We know nothing of the essential nature of hysteria; all that we know is that there are certain manifestations which go to make up this disease of hysteria; in other words, our knowledge is confined to the clinical manifestations.

In children, hysteria presents a peculiar clinical history, depending upon the age of the child. The younger the child the more does it tend to be monosymptomatic and the rarer are stigmata; the older, the more does it approach the adult form. In the young child the single symptom is a "massive" one (Bruns). It controls the whole clinical picture, and there are no stigmata; indeed, very few could be detected even if they were present in an infant. In the four cases reported, these characteristics are fairly well marked. In the infant, Case III, there is no other symptom present except the anorexia, no psychical or physical evidence of hysteria. In Case I we have psychical evidences, in Case II we have the adult form of hysteria and in Case IV there is the anesthesia. Aside from Case III, all may be considered as hysterical because they all had some stigma and had a neuropathic history.

In Case III the whole question of infantile hysteria comes up for discussion. Most authors claim that hysteria does not occur before the second or third year of life. But Chaumier (1892), and after him a number of French authors, have claimed that hysteria occurs in early infancy, stating that irritability and convulsions are evidences of hysteria (the symptoms that are usually ascribed to teething). It seems to me that Thiemich's objection to Chaumier's views is a valid one; that even if such children who had suffered from infantile convulsions had a neuropathic history more frequently than others or afterward became nervous or hysterical, it would not prove that the eclampsia could be called hysteria.

In this child there was nothing of this sort; the essential and

only features which would make us think of hysteria are, from an etiological point of view, first, the family history, and secondly, the peculiar way in which this child was brought up; there was no evidence of physical alteration; only these two facts and the symptom anorexia.

I have seen a large number of infants who refused food after weaning. I have also seen a number who, although forced to take food, immediately, vomited it; in all these cases where proper discipline was employed the children gave in to that method of feeding which seemed proper to those in charge. In this case there was an attempt at weaning which was given up by the weak mother because the child would not eat. Afterward, in the hands of the trained nurse, the child did the same, so that forcible feeding became necessary, all the time taking water in the normal way. Finally, at the end of two weeks, the child began to take food. In older children this is a condition that might be explained by taking into consideration autoimitation. When first artificial food was given the child would not take it because it tasted differently, had a different consistency, was taken differently or what not. When the attempt was again made it again refused because it had done so before; finally it continued to refuse. It may be doubted that in so young a child so complex a psychic process could have developed as that necessary for autoimitation. Yet here was a precocious child, and, after all, although we are justified in considering with Jolly the psychic processes in infants as simple, we are not in a position to determine how simple they are; indeed, those who see much of infants are frequently forced to the conclusion that they may be quite complex. However this may be, under all circumstances, I believe, we are justified in considering the anorexia as a psychial manifestation; if this is admitted, the whole clinical picture in the patient leads us to the inevitable conclusion that we are dealing with infantile hysteria. Since I treated my first patient with anorexia nervosa in 1891 I have never seen any case except the one just discussed in which there was any doubt as to Laségue's view of the etiology, viz. that it is hysteria or hypochondriasis. It is interesting to note, furthermore, that Laségue described in 1873 very much the same psychial process as leading to hysteria as is now accepted by the most advanced neurologists.

It will be seen that, of the cases reported here, three recovered and a fourth one died, the latter not being permitted to come under treatment by its parents. I believe that all these cases can be cured (and here I am in accord with the modern writers) provided they are properly treated. This statement does not mean that they can be cured of their hysterical tendencies, but only of the condition now under discussion. It does mean, however, that by proper treatment during childhood the hysterical tendencies are so reduced that, in a number of my patients, what seem to all appearances as normal adults have developed from extremely neurotic children. The discussion of the prophylactic treatment would lead us too far from our subject, but especial stress must be laid upon discipline of thought and action, which should be begun at birth by regulation of habits and continued in older children in all directions until these activities become almost automatic, when self-discipline is arrived at. Aside from this, all the prophylactic measures for hysteria in children should be carried out when possible. In order that a child be cured of it there are required: a proper physician, a proper nurse and proper surroundings. The characteristics required of the physician have been so frequently described that I desist from repetition except to state that "the pure scientist should keep his hands off these cases," as he not only fails, but also "spoils them for future treatment by others who understand the art." The art consists in the treatment of the mental state, which, after all, is the essence of the condition. This is done by suggestion. Recently works have been written in which the various methods have been classified and described. He who uses the art of suggestion as described in books will never accomplish much, because it is with this art as it is with all other arts: there are certain things which are born in an artist and which are gained by experience, the deficiency of which cannot be made up by books. After all, suggestion is most easily carried out in children; indeed, suggestibility is one of the characteristics of the child's mind; it is not then so difficult as it is in adults. It is more valuable in older children than in infants; according to my experience with the latter, force is more frequently required than suggestion.

But before going on with suggestion, it is necessary that the physician study his individual patients to find out their peculiar-

ities and adapt his methods to these. After having studied the patient as to habits, temperament, and having closely watched all the manifestations, at the same time trying to gain the patient's confidence, a plan of treatment, mental and psychical, is mapped out. This should be followed consistently and with firmness; the child is then, as it were, driven with a firm bit which must neither be pulled upon nor relaxed for ordinary purposes. Occasionally it may become necessary to start with severe measures and then relax, or it may become necessary, during the course of the treatment, to make the suggestive measures severe. Drugs may be used as suggestive measures, as in the hysteria of adults. Electricity and hydrotherapy are also most valuable in this direction; I do not wish to be understood as saying that this is the only way in which they are valuable.

The nurse should be chosen as for every other case of hysteria; she should have special interest in children; and it is better if she has had special training.

The surroundings are of paramount importance. In order that the best results may be obtained the child must be removed from its ordinary surroundings. This principle, first expressed by Weir Mitchell for the treatment of hysteria, is of even greater importance in children than in adults. The best thing that can be done for these children is to remove them to a properly equipped institution of some kind. But it is practically impossible to convince parents that this is necessary and that the mother is not the proper person to take care of this kind of illness. It then depends upon the urgency of the symptoms, in anorexia nervosa, whether it is possible to compromise so as to carry out seclusion in the home. If the child presents serious symptoms of starvation no compromise should be entered into; under these circumstances the parents are ready to submit to any measure in order to save the child's life, although exceptions occur, as in Case IV. When the other symptoms of hysteria are the prominent ones and the starvation is not excessive, a compromise as to home treatment may be entered into. But it has been my experience that, in a majority of cases, the rest cure when carried out at home does not give the same results as when carried out in an institution. A number of these cases have relapses when treated at home or do not get well at all, but simply improve. The reasons for

this are obvious: in very few instances has it been possible to keep members of the family out of the room of the patient for from six to eight weeks; and one outburst of hysterical sympathy does more harm than can be overcome by a long isolation. Moreover, it is helpful to have the suggestive effect of strange surroundings. My own practice is to inform the parents that home treatment is a compromise, that it is not the best method of treatment, that relapses occur, but that it may be tried with this understanding, provided always there is no danger to life.

In anorexia nervosa the feeding, after all, is the controlling factor in the situation. In most cases, where children come under complete control of the rest cure, with all its many routine performances, the taking of food naturally becomes one of these routine acts. In such cases large quantities of food of the nature suitable to the child's age may be given, the object being to cause increase in weight and to improve tissue nutrition; milk, eggs and cereals to begin with form an excellent dietetic basis to build upon. In those cases where the routine does not produce this effect, feeding taxes the skill, the patience, the endurance and the resourcefulness of the physician to the utmost. Rectal feeding is of even less value in the child than in the adult; at the utmost, fluid can be added to the circulation by it, which is, it is true, of importance in the prevention of absolute starvation, but that is all, except suggestive effects. I have succeeded more than once in inducing this kind of child to take something to eat by leaving food by its bed, and asking the nurse to give it a chance to eat it without being seen by her. This is only in accord with simulation which the child has been practicing for a long time, but which, as Jolly says, must not be spoken of aloud as existing in connection with hysteria. While this method of stimulating simulation does not cause the child to gain in weight, yet it prevents loss, and, moreover, it gives the physician a decided advantage, as it may be used as the thin end of a wedge. Gavage must always be held up before the child as the last resource; it is well to speak of it casually to the nurse when things go badly, finally making direct threats to the patient. Of the large number of cases which have been under my care, the infant reported here is the only one which required gavage.

The other hysterical symptoms present in the patient require

further treatment, as a rule; in the patient with astasia-abasia the anorexia was controlled, but the astasia-abasia remained for some time longer.

All other routine methods which are required for the rest cure must be applied in addition to those recommended.

STREPTOMYCIN FOR TUBERCULOUS MENINGITIS IN CHILDREN, (Lancet, London, 1: 341, Feb. 25, 1950). MacCarthy and Mann review results obtained with streptomycin in the treatment of 43 children with tuberculous meningitis between January 1947 and June 1948. The shortest period of observation was one year and four months, the longest two years and eight months. All except 2 of the children were less than 7 years of age. In 40 of the 43 children the diagnosis was proved by bacteriologic examination. Various treatment schedules were employed. The authors gained the impression that the initial response to treatment depends on a combination of several factors besides streptomycin—age, mechanical obstruction of the cerebrospinal pathways, early diagnosis, innate resistance to tuberculosis and perhaps virulence of the tubercle bacillus—and is not greatly influenced by the manner of treatment at the start. The proportion of recoveries will depend much more on the number of initially responsive cases than on the particular rhythm of treatment. In cases showing an initial response to treatment the shortest road to full recovery seems to be a three months' course of combined intramuscular and intrathecal streptomycin (with not less than fifty intrathecal injections) followed by intramuscular treatment until the cerebrospinal fluid has been normal on two occasions over a period of three months. A high proportion of survivors and ultimately of full recoveries can be obtained by giving a much shorter course of combined treatment with rest periods (plus intramuscular continuation treatment), provided this is repeated, whenever the cerebrospinal fluid response is inadequate or recrudescence threatens. But this method is liable to extend the treatment for well over a year and cannot be recommended in practice.—*Journal A.M.A.*

DEPARTMENT OF ABSTRACTS

UHLEY, M. H.: THE ELECTROCARDIOGRAM IN CONGENITAL HEART DISEASE—A POSTMORTEM CORRELATION STUDY OF 53 CASES. (Annals of Internal Medicine, 33:188, July 1950).

Following a study of 53 cases of congenital heart disease that were also studied at postmortem, the author proposes that there are specific electrocardiogram patterns which are pathognomonic of one type of heart lesion and nonspecific patterns that are found in a great many congenital anomalies. The nonspecific pattern of right heart strain and the Katz-Wachtel phenomenon are both frequently found patterns and are elicited in a great variety of congenital anomalies. The specific electrocardiogram patterns are found in the following conditions and are pathognomonic: 1. Dextrocardia—identified by the inversion of the major components of Lead I. 2. Anomalous origin of the left coronary artery from the pulmonary artery—identified by the pattern of anterior wall myocardial infarction in infancy. 3. Von Gierke's disease—identified by the presence of a combined heart strain pattern. 4. Lesions producing a left heart strain pattern are those affecting the systemic outflow tract and aorta, such as aortic stenosis and coarctation of the aorta, those affecting the tricuspid valve, such as tricuspid atresia and Ebstein's disease, truncus arteriosus communis and single ventricle. MICHAEL A. BRESCIA, M.D.

GRABER, T. M.: CHANGING PHILOSOPHIES IN CLEFT PALATE MANAGEMENT. (Journal of Pediatrics, 37:400, Sept. 1950).

Cleft palate individuals as a group show deficient patterns of maxillary growth, laterally, anteroposteriorly and vertically. Early and traumatic surgery results in the greatest deformity. There is a positive correlation between the number of operations, the amount of scar tissue and the degree of insult. To minimize interference with growth centers, it seems advisable to postpone surgical correction at least until the end of the fourth year of life, when five-sixths of the total maxillary width has been accomplished. However, it must be remembered that downward and forward growth, which depends primarily on the spheno-occipital synchondrosis and sutural activity, continues until 20 years of age. It appears that the surgically repaired palate grows more slowly than

the surrounding soft tissue. This results in increasing functional difficulty and ultimate structural inadequacy. Patients whose palatal clefts have not been surgically manipulated show a pattern of maxillary growth that is essentially normal. Closure of non-operated clefts by prostheses seems quite successful, if judged by the general intelligibility of speech and ease of mastication and deglutition. AUTHOR'S SUMMARY.

NICHOLSON, M. M.: JUVENILE DELINQUENCY. (Journal American Medical Association, 144:1538, Dec. 30, 1950).

The juvenile delinquent is not a type of child. He has gone astray as the result of insufficient guidance and care. The juvenile delinquent is not depraved; he is just deprived. Of 4,000 repeated offenders appearing in the juvenile courts of Chicago and Boston, over 70 per cent were mentally normal. The cost of juvenile crime is estimated at 15 billion dollars a year. But this money value pales when we consider that the most pernicious waste is not material but moral. It has been found that foreign-born white children show a smaller rate of delinquency than native-born white children. The broken home is one of the weightiest factors in juvenile delinquency, because it leaves the child with no attachment on which to grow. The delinquency committee of the White House Conference reported that 37 per cent of 2,191 delinquents studied had absolutely no church connections. Most of the others had little religious training. When Columbus landed, his first act was to pray. When those seeking refuge landed in Massachusetts and in Maryland, their first act was prayer. The entire South and Southwest was settled by religious groups who prayed. George Washington frequently prayed, and Lafayette and Washington went together to church to ask God's guidance during the Revolution. "In God We Trust" was placed on our money. The Congress of the United States opens with prayer. Why deprive our children of the joy of prayer or the pleasure of asking the old fashioned "blessing" before meals? The child who has God to rely on is never lonely, lost or in trouble.

MICHAEL A. BRESCIA, M.D.

MASSELL, B. F. AND WARREN, J. E.: EFFECT OF PITUITARY ACTH ON RHEUMATIC FEVER AND RHEUMATIC CARDITIS. (Journal American Medical Association, 144:1335, Dec. 16, 1950).

The clinical effect of ACTH has been observed in 20 patients with active rheumatic fever. In many patients the rheumatic process was severe, and most of them had active carditis. The initial response of fever and joint involvement was especially impressive, but pericarditis, subcutaneous nodules and other rheumatic manifestations also frequently disappeared during hormone therapy. Withdrawal reactions with clinical manifestations of rheumatic fever or with only elevation of the ESR were sometimes observed when therapy was completed. In most but not all such instances these signs of rheumatic activity again subsided spontaneously over varying periods of time without any further treatment. Of two patients with chorea, one showed striking improvement in association with ACTH therapy; the other failed to respond to a 10 day period of treatment with the hormone in large doses. Treatment has been completed in 17 of the 18 patients with rheumatic manifestations other than chorea. Three of these must be considered therapeutic failures. Although the total duration of acitve rheumatic fever varied greatly in the remaining 14 patients, it was our impression that, on the whole, recovery took place sooner than it would have without treatment. The apparent response of pericarditis, congestive failure and subcutaneous nodules to ACTH in a number of patients and the complete disappearance in two patients of all significant murmurs strongly suggest that in some instances active carditis may be favorably influenced by hormone treatment. Also, there are hopeful indications that if therapy is begun early in an attack of rheumatic fever cardiac damage may be lessened or prevented. The only harmful reactions definitely attributable to ACTH in this series were retention of fluids with aggravation of congestive heart failure and, in one instance, serious mental depression. It is possible that in one patient with long standing low grade rheumatic fever the degree of rheumatic activity was greater after discontinuation than prior to the administration of the hormone. The mechanism of hormonal influences in rheumatic fever is not yet understood.

AUTHORS' SUMMARY.

STEFANINI, M.; ROY, C. A.; ZANNOS, L., AND DAMESHEK, W.: THERAPEUTIC EFFECT OF PITUITARY ADRENOCORTICOTROPHIC HORMONE (ACTH) IN A CASE OF HENOCH-SCHÖNLEIN VASCULAR (ANAPHYLACTOID) PURPURA. (Journal American Medical Association, 144:1372, Dec. 16, 1950).

A case of severe anaphylactoid purpura of the nonthrombopenic Henoch-Schönlein type with glomerular involvement in a child 3 years of age was treated with ACTH, with the following results: (a) The treatment was followed by striking regression of the vasculitic changes characteristic of the disease. The abdominal symptoms were promptly relieved and the cutaneous hemorrhagic manifestations diminished quickly. (b) Mild abdominal symptoms and petechial manifestations reappeared after the suspension of the therapy but regressed spontaneously in a short time. (c) The signs of renal involvement were only temporarily affected by hormone therapy, which did not prevent the establishment of a mild chronic glomerulonephritis. (d) Remarkable changes in the personality of the patient were observed; these regressed shortly after the suspension of therapy. AUTHORS' SUMMARY.

HYPERTRICHOSIS DURING STREPTOMYCIN THERAPY. (Annales Paediatrici, Basel, 174: 389, June 1950). Fonó says that, of 27 children (15 boys and 12 girls) who were treated with streptomycin for military tuberculosis or for tuberculous meningitis, all but five exhibited hypertrichosis after six to eight weeks of treatment with streptomycin. The hypertrichosis usually appears first on the upper side of the limbs and successively spreads over most of the body, except the neck, elbows, knees and gluteal region. The growth is thick and the length 1 to 3 cm.; the color is similar to that of hair on the head. Hypertrichosis has been observed in persons of both sexes from 3 to 14 years of age. The hypertrichosis persisted after treatment with streptomycin was discontinued. In one case hypertrichosis is still present after 12 months have elapsed. How the hypertrichosis develops has not been ascertained. It may be caused by the streptomycin or may result from the disease after the streptomycin has saved the life of the patient. —*Journal A.M.A.*

BOOK REVIEW

NURSING IN PREVENTION AND CONTROL OF TUBERCULOSIS. By H. W. Hetherington, M.D., and F. W. Eshleman, R.N. 3rd Ed. Cloth. Pp. 361. Illustrated. Price $4.50. New York: G. P. Putnam's Sons, 1950.

This book presents the story of tuberculosis simply and clearly which makes it a valuable teaching and reference book for the nurse. The public health aspects of tuberculosis are constantly kept in mind and emphasized throughout the book. In a disease, such as tuberculosis, one cannot emphasize too much the broad public health implications. This is particularly true with regard to the nurse who carries not only the responsibility of the care of the patient but also the education of the patient and the people who may come in contact with the patient. Proper attention of course is to be focused on the contagiousness of the disease and the method of its propagation. MICHAEL A. BRESCIA, M.D.

THYMUS DEATH IN NEWBORN AND NURSLINGS. (Medizinische Klinik, Munich, 45:395, March 31, 1950). Mink describes 4 sudden deaths in newborn and infants in which hyperplasia of the thymus seemed to play a part. He suggests that in some cases, particularly in those in which asphyxiation takes place during the delivery or while the infant takes the first few breaths, mechanical factors, particularly an enlarged thymus, may play an important part. In the first 2 of his 4 patients the thymus weighed 38 and 42 Gm., respectively, that is about three times the normal maximum of 13.26 Gm. The first of these infants was large with excessive width of the shoulders. In this connection it is pointed out that the sternovertebral diameter in which the thymus is located is subjected to considerable compression during certain phases of delivery and that excessive size of the thymus may increase the pressure on vital vessels and nerves. Pressure of the thymus on the vagus with resulting death is likewise possible. It has not been definitely proved that the thymus hormone may be responsible for some deaths in infants. Mink cites opinions of Bomskov and others on the problem of the role of the thymus hormone.—*Journal A.M.A.*

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